

Device and System for Measuring the Properties of Multi-Segmented Filters and Corresponding Method

Patent Claims

1. A measuring device for measuring the properties of multi-segmented filters (61 – 64) in the tobacco-processing industry by means of a light-transmission method, wherein a radiation source (85) and a radiation receiver (82, 80) are provided and the radiation source (85) permits an essentially uniform radiation in longitudinal axial direction of a multi-segmented filter (61 – 64), characterized in that the radiation receiver (82, 80) is arranged within a conveying element (21, 31, 34) which is designed for conveying at least multi-segmented filters (61 to 64).
2. The measuring device according to claim 1, characterized in that the radiation source (85) comprises a plurality of individual radiation sources (81), arranged in longitudinal axial direction of a receiving trough provided in the conveying element (21, 31, 34).
3. The measuring device according to claim 2, characterized in that the radiation sources (81) are light-emitting diodes.
4. The measuring device according to one or several of the claims 1 to 3, characterized in that the radiation receiver (72, 80) comprises at least one receiving element (72), in particular extending in longitudinal axial direction of a receiving trough arranged in the conveying element

(21, 31, 34), or a plurality of receiving elements (80) that are arranged in longitudinal axial direction of a receiving trough arranged in the conveying element (21, 31, 34).

5. The measuring device according to claim 4, characterized in that photodiodes are used for the receiving elements (80).

6. A system for measuring the properties of rod-shaped articles in the tobacco-processing industry or components of rod-shaped articles that are subsequently combined to form rod-shaped articles, in particular multi-segmented filters (61 to 64) and/or filter cigarettes provided with multi-segmented filters (61 to 64) by using a first measuring device (41) for measuring the articles or components of the articles with a reflection technique, characterized in that a second measuring device (43) is provided for measuring the articles or components of the articles by means of a light-transmission method.

7. The measuring system according to claim 6, characterized in that the second measuring device (43) is a measuring device as disclosed in one or several of the claims 1 to 5.

8. The measuring system according to claim 6 and/or 7, characterized in that a third measuring device (42) is provided, by means of which the articles or components of the articles are measured with a reflection technique.

9. The measuring system according to one or several of the claims 6 to 8, characterized in that the measuring devices (41 to 43) are arranged in and/or on a filter tipping machine (1).
10. The measuring system according to claim 9, characterized in that the first measuring device (41) is arranged in a region of the production process for rod-shaped articles that is located downstream of a station (5) for combining the components (60 to 64) or the articles.
11. The measuring system according to claim 10, characterized in that the first measuring device (41) is arranged on and/or in a transfer drum (21) that is located downstream of the first drum (5) which combines the components.
12. The measuring system according to one or several of the claims 9 to 11, characterized in that the second and/or third measuring device (42, 43) is arranged in a region where rod-shaped articles are produced and which is located downstream of a station (23, 24) where an article (60 to 64) is wrapped at least partially with a tipping paper (52).
13. The measuring system according to one or several of the claims 10 to 12, characterized in that the station consists at least in part of drums.
14. The measuring system according to one or several of the claims 6 to 13, characterized in that the first and/or the third measuring device (41, 43) comprises a radiation source (85) by means of which rod-shaped articles or components (60 to 64) of rod-shaped articles essentially

can be radiated within a measuring range and that the first and/or third measuring device (41, 43) comprises a radiation receiver (72) for receiving the radiation reflected by the articles (60 to 64) or the components (60 to 64, 52).

15. The measuring system according to claim 14, characterized in that the radiation receiver (72, 80) comprises several receiving elements (80) that are arranged in a row.

16. The measuring system according to claim 14, characterized in that the radiation receiver (72, 80) is a position-sensitive receiver that extends in at least one direction and, in particular, comprises a charge-coupled device (CCD).

17. A filter tipping machine (1) with at least one measuring device according to one or several of the claims 1 to 5 and/or a measuring system according to one or several of the claims 6 to 16.

18. A quality assurance method for filter cigarettes with multi-segmented filters (61 to 64), wherein the values for the radiation reflected by the filter components (61 to 64) of the multi-segmented filter are compared to first set values with the aid of a reflection technique and in a first measuring device (41) and wherein the filter cigarette or the components (60 to 64) of the filter cigarette are discarded if the deviations exceed the values of a first preset tolerance range.

19. The method according to claim 18, characterized in that the radiation which has passed through the filter components of the multi-segmented filter and a tipping paper (52) that is wrapped around these components is compared in a second measuring device (43) to second set values by means of a light-transmission method, wherein the filter cigarette is discarded if the values deviate by exceeding a second preset tolerance range.

20. The method according to claim 18 and/or 19, characterized in that the radiation reflected by the tipping paper (52), wrapped around the multi-segmented filter (61 – 64), is compared to third set values in a third measuring device (42) by means of a reflection technique, wherein the filter cigarette is discarded if the values deviate by exceeding a preset third tolerance range.